



Resource Efficient Scotland: Long-term follow up with supported organisations

Final report of findings



EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future

Contents

| | | |
|----------|---|-----------|
| 1 | Executive summary | 3 |
| 2 | Introduction | 6 |
| 2.1 | Context and objectives for the study | 6 |
| 2.2 | Method summary | 8 |
| 3 | Long term implementation of resource efficiency measures | 11 |
| 3.1 | Overall progression | 11 |
| 3.2 | Realisation of measures | 14 |
| 3.3 | Not progressing measures | 16 |
| 4 | Benefits of action | 19 |
| 4.1 | The lifespan of beneficial outcomes from implemented action(s) | 19 |
| 4.2 | Realisation of employment benefits | 20 |
| 5 | Conclusions and implications for future evaluation | 22 |

1 Executive summary

Zero Waste Scotland Ltd is Scotland's resource efficiency and circular economy expert. Zero Waste Scotland advice and support includes one-to-one in-depth advice to public, private and third sector organisations to reduce their costs by implementing resource efficiencies in energy, water, raw materials and waste management. Advisors provide detailed and quantified recommendations for action at individual sites, with a focus on SMEs.

The RES programme has been evaluated annually – with an emphasis on producing robust, quantified impact figures for funders. Current methodology uses a relatively short time frame between delivery of support and impact evaluation. Investigation is required to ensure that existing assumptions relating to realisation of planned measures, lifespan of implemented measures etc. are reasonable, in order to ensure accuracy of forecasting and estimation of lifetime impacts. The research was intended to provide greater understanding of:

- The extent to which partially implemented or planned measures are fully realised, the extent to which measures which beneficiaries had 'no plans to implement' have actually been progressed;
- The extent to which anticipated employment benefits (jobs created and safeguarded) are realised, as well as the nature of these jobs, how they relate to the measure implemented and accuracy of original reporting; what numbers actually arise and why.
- The lifespan of the beneficial outcomes that businesses report in the impact evaluation.
- Across all of the above, identifying any differences based upon beneficiary circumstances and any broader factors useful in understanding the results.
- On the basis of the above, considering potential implications of the results/insights for when and how Zero Waste Scotland evaluate future RES in-depth support.

Overall the study sampled 50 beneficiaries (covering 166 measures) from the 2013-14 and 2014-15 support years across a range of profiles (sector, size, energy intensity etc.). All interviews were conducted as semi-structured telephone interviews in March 2017.

Limitations for the reader to bear in mind when interpreting the findings and conclusions are as follows:

1. The study does not comprise a statistically robust examination of the beneficiary support base and progress on action.
2. Linked to this, sampling was deliberately focused primarily upon those who had been planning at least one measure at the time of the original evaluation.
3. The predominance of energy-related measures (in both the support delivered and the sample explored in this study) means the findings may be of limited value when trying to draw definitive conclusions regarding longer term implementation of non-energy measures.

To what extent are partially implemented or planned measures fully realised, and to what extent have measures which beneficiaries had 'no plans to implement' have actually been progressed?

The study found a substantial progression of measures since the original evaluation:

- Almost half of partially implemented measures (8 out of 19) have been either fully implemented or are still partially implemented but to a greater degree. Where an outcome has been reached, 25 out of 50 planned measures have been fully or partly implemented, so supporting Zero Waste Scotland assumptions on the savings realised by measures reported as "planned" at the time of original evaluation. The remaining 11 planned measures are still being planned so this assumption assumes a broadly 50/50 realisation split for these. On this basis, the Zero Waste Scotland assumption that 50% planned activity will ultimately be implemented seems broadly correct.
- Where previously there were no plans to implement a measure, in 19 out of 62 cases this measure is now either fully/partially implemented (14) or is planned to be so (5), indicating that Zero Waste

Scotland should factor in some turnaround of an initial lack of plans. Therefore the Zero Waste Scotland assumption that “no plans to implement” equals zero impact is an underestimate,

- Conversely, Zero Waste Scotland should also ensure that they are accounting for the low level of organisation discontinuation, which – if that organisation took action prior to ceasing to trade - means implementation is reversed. Therefore the assumption that 100% of implemented actions persist for estimated lifetimes is a slight overestimate due to evidence of some cessation of businesses, though these businesses may not act anyway.

To what extent are anticipated employment benefits (jobs created and safeguarded) realised, as well as the nature of these jobs, how they relate to the measure implemented and accuracy of original reporting?

The key finding was that evidence of employment-related benefits from use of beneficiary interview responses is limited and quite speculative i.e. not always directly linked to the implementation of measures. This is partly due to the minimal financial benefit of the measures they had taken to date, especially when compared with variances in business performance.

The findings highlight the need for consideration of options i.e. how far it is possible / cost effective for claimed employment benefits to be scrutinised closely and the likelihood of realisation assessed, or whether to eliminate these questions and attempt a top-down assessment – or similar - instead.

The lifespan of the beneficial outcomes that businesses report in the impact evaluation.

Respondents re-stated the anticipated lifetime of the technology when assessing persistence of impacts. Few have experienced or expect any significant changes in impact year to year, aside from situations where they are slowly introducing a measure (like upgrading lighting).

The current behavioural measure lifetime trajectory assumes a 5 year straight line decline to zero from impact after Year 1 to Year 5; the data does not definitively support or refute this, though the study was sometimes not in sufficient detail to explore the original and ongoing impact of any implemented behavioural recommendations e.g. training.

Were there any differences based upon beneficiary circumstances and any broader factors useful in understanding the results?

Measure type is a strong factor affecting lead time to implementation; it affects levels of up front research required, cost, perceived and actual disruption and the extent to which sourcing of specialist suppliers / installers is required.

Often linked to measure type, the conditions that seem to be important – or at least can move a measure from not implemented to implemented – tended to comprise triggers: finance becoming available, a realisation that the measure (or a variant on it) would be required anyway e.g. refurbishment or previous equipment needing replacement, landlord support (if renting), and a supportive senior management team. Whilst low profit margins do not preclude action being taken, more recommendations were realised more quickly amongst those with very healthy (+20%) margins.

The issues and barriers affecting realisation of a recommended measure were often the corollary of the factors that may encourage action e.g. having rented premises, measures being large / complex (and so carrying cost, technical feasibility, disruption, and resource implications), poor business performance and low payback. It seemed that even where the money was available, tenure and building regulations could prevent action.

On the basis of the above, what are the potential implications of the results/insights for when and how Zero Waste Scotland evaluate future RES in-depth support?

The following list summarises the effect of the findings upon three key assumptions used by Zero Waste Scotland for forecasting lifetime impact of the support:

- The assumption that 50% planned activity will ultimately be implemented seems broadly correct; currently 41% of the measures planned at the time of the original evaluation have now been implemented and a further 18% are still being planned.
- Conversely, the assumption that “no plans to implement” equals zero impact is demonstrably an underestimate, largely because few organisations dismiss the possibility of taking the measure completely, and plans will change over time due to a range of factors and triggers.
- The assumption that 100% of implemented actions persist for estimated lifetimes is a slight overestimate due to evidence of some cessation of businesses, though these may also be the types of businesses least likely to act at all anyway.

The results indicate the value in following up on measure implementation several years after the original support. However, this follow up can lead to a commensurate reduction in strong attribution to the support. This therefore implies the value of making sure to retain a more immediate evaluation, necessary anyway to report likely impacts to satisfy Scottish Government / other funder requirements.. There may also be value in speaking to the RES advisors to triangulate beneficiary claims that ‘they would have got there anyway’.

As to when any follow up should take place, after 3 years most of the recommended measures will be either completed or a decision taken not to implement, albeit this could still change given the right trigger. Zero Waste Scotland may wish to consider supplementing each annual evaluation of the previous year’s support with a small follow-up study to track action amongst previous beneficiaries¹.

Regarding employment benefits arising from action, any initial evaluation claims / predictions of this should be probed in depth to determine the actual likelihood of these being realised.

¹ This is something we have done for many years on our annual evaluations of Energy Saving Trust Home Renewable Advice and Grant support.

2 Introduction

2.1 Context and objectives for the study

Zero Waste Scotland Ltd (Zero Waste Scotland) is Scotland's resource efficiency and circular economy expert. Funded by The Scottish Government, Zero Waste Scotland's work supports delivery of the Circular Economy Strategy – *Making Things Last* and other policy priorities relating to low carbon and sustainability.

The RES advice and support service has provided one-to-one in-depth advice to public, private and third sector organisations since 2013 to reduce their costs by implementing resource efficiencies in energy, water, raw materials and waste management. The programme is funded by the Scottish Government and European Regional Development Funding, and managed by Zero Waste Scotland (Zero Waste Scotland). RES delivers advice and support through a range of in-depth delivery activities, where advisors provide detailed and quantified recommendations for action at individual sites, with a focus on SMEs.

The RES programme has been evaluated annually – with an emphasis on producing robust, quantified impact figures for funders. Current methodology uses a relatively short time frame between delivery of support and impact evaluation (minimum of 6 months and maximum of 18 months). A significant portion of beneficiaries that take part in the evaluation may intend to fully implement recommended measures but can only report these as partially implemented, planned or not implemented at the time of the evaluation. The timing of impact evaluation will involve a number of trade offs including reporting timelines to funders, allowing sufficient time for the opportunity to act on advice, and the ability of beneficiaries to recall support provided.

The focus on quantified impact assessment, coupled with interview length constraints, reduces opportunity for more qualitative investigation. Deeper investigation is required to ensure that existing assumptions relating to realisation of planned measures, lifespan of implemented measures etc. are reasonable, in order to ensure accuracy of forecasting and estimation of lifetime impacts.

Having recently completed evaluation of in-depth RES support delivered in 2015-16, the Zero Waste Scotland evaluation team identified a number of additional research questions that they would like to approach as a distinct qualitative project (as opposed to a new / revised quantitative impact assessment). Overall, the research tested Zero Waste Scotland assumptions on realisation of action and outcomes for the beneficiaries we interviewed. Specifically, the work was intended to provide greater understanding of:

- Longer term analysis of implementation and inform current assumptions around planned activity²; the extent to which partially implemented or planned measures are fully realised, the extent to which measures which beneficiaries had 'no plans to implement' have actually been progressed;
- Provide longer term analysis of workforce impacts; in particular the extent to which anticipated employment benefits (jobs created and safeguarded) are realised, as well as the nature of these jobs, how they relate to the measure implemented and accuracy of original reporting; what numbers actually arise and why.
- The lifespan of the beneficial outcomes that businesses report in the impact evaluation.
- Across all of the above, identifying any differences based upon beneficiary circumstances and any broader factors useful in understanding the results.
- On the basis of the above, considering potential implications of the results/insights for when and how Zero Waste Scotland evaluate future RES in-depth support.

² In recent impact evaluations, where beneficiaries state they have firm plans to implement a measure, we typically assume 50% of savings will be implemented

One lifetime impact factor not explored was rollout amongst multi-site organisations, on the basis that Zero Waste Scotland have already found – in the most recent impact evaluation conducted in 2016 - evidence of wider roll out of measures at other sites.

2.2 Method summary

2.2.1 Data collection overview

The study sampled organisations that had been supported in 2013-14 or 2014-15 and evaluated in late 2014 and 2015 respectively); therefore we had implementation status data at the time of this first evaluation interview.

Overall we conducted 50 interviews (covering 166 measures) with RES support beneficiaries from the 2013-14 and 2014-15 support years. All interviews were conducted as semi-structured telephone interviews in March 2017.

Two findings pertinent to future evaluation activities which involve re-visiting previously evaluated beneficiaries were:

- a. Only one organisation refused to participate; this was an organisation which had been seeking support as a route to funding but were unsuccessful in finding any appropriate funds.
- b. Only three organisations were found to have ceased trading. This does not indicate any causation (and not all beneficiaries on the database could be reached to confirm a discontinuation rate for the whole customer population).

2.2.2 Sample numbers and breakdown

The table below provides a breakdown of the 50 interviews across key characteristics. Within each category the interviews should add up to 50 and the measures 166, except the last group where 3 organisations had predicted both job creation and job safeguarding measures:

| Sample group | No. of interviews (and measures) |
|--|-------------------------------------|
| Overall | 50 interviews (166 measures) |
| <i>Of which...</i> | |
| Supported / evaluated in 2013-14 | 17 (60) |
| Supported / evaluated in 2014-15 | 33 (106) |
| <i>Of which....</i> | |
| Had fully implemented at least one measure at the time of the first evaluation | 21 (25) |
| Had partially implemented at least one measure at the time of the first evaluation | 11 (19) |
| Were planning at least one measure at the time of the first evaluation | 33 (61) |
| Had not taken at least one measure at the time of the first evaluation | 28 (61) |
| <i>Of which....</i> | |
| Had cited achieved / anticipated job creation benefits in the original evaluation | 8 (20) |
| Had cited job safeguarding benefits in the original evaluation | 8 (31) |
| Neither | 37 (115) |

Table 1: Sample breakdown [n=50]

In terms of organisational profile, the sample contained a wide variety of organisations:

| Organisational characteristic | Description of the sample |
|-----------------------------------|---|
| Respondent | The sample covered a range of roles / job titles, usually dependent on organisational size and so the extent to which energy management had become a delegated role. The sample included owners and managing directors through to general managers, engineers, and administrators. Only in one case did an organisation have an energy specialist (and even then their role was labelled 'environmental manager'), which reflects the generally small size of the beneficiaries. |
| Sector | The sample achieved a diverse range of organisational activities and so site uses; the sample included the following: hotels, retail, nursery/education, farms, village halls, pubs/inns, offices, holiday parks and manufacturing. It was agreed that public sector organisations would be excluded. |
| Size (FTEs) | All sampled organisations were SMEs (i.e. less than 250 FTEs). The average FTE size was 19 and the sample ranged from no employees to just over 200. If the 203 FTE outlier is ignored, the average is around 15 FTEs. |
| Sites and tenure | Overall 33 of the sample operate from a single site and 17 from multiple sites, with an identical split (33 and 17 respectively) for those who own their premises and those who rent. There did not seem to be any correlation between tenure and number of sites. |
| Organisation age | Numbers ranged from <1 year to 300 years, with an average of 48 years (even if the outlier of 300 is ignored, the average is 43 years) ³ . |
| Number and type of recommendation | As stated above, the total number of recommended measures covered by the sample was 166, equating to an average of just over 3 per organisation; numbers range from 1 recommendation up to 8. |
| | Whilst we succeeded in covering a range of measure types (energy, waste, water, behavioural etc.), the measure breakdown reflects the fact that the vast majority of recommendations were for energy-related measures (either physical or behavioural). |
| Energy consumption | Half the sample were able to provide data on their latest annual energy costs, though fewer could state what proportion of their organisation's total costs this comprised. There did seem to be a correlation between respondent role and knowledge of energy costs i.e. more senior respondents had full sight of costs, less senior individuals less so, and especially lacked sight of total organisational costs, hence the disparity between the number who could state energy costs and the number who could state % of total costs. |
| | Regarding energy costs, these averaged just over £10,000 per annum, with a range of £1,200 up to £35,000 ⁴ . |
| | Regarding the % of all business costs accounted for specifically by energy, the average % was 24%, with a range of 1% up to 90%. |

Table 2: Exploration of sample profile range [n=50]

³ Though if the median rather than mean is used, the average halves to 22 years.

⁴ Again, if the median rather than mean used, the average reduces to around £7,000 per annum.

2.2.3 *Limitations*

There are a few limitations for the reader to bear in mind when interpreting the findings and conclusions:

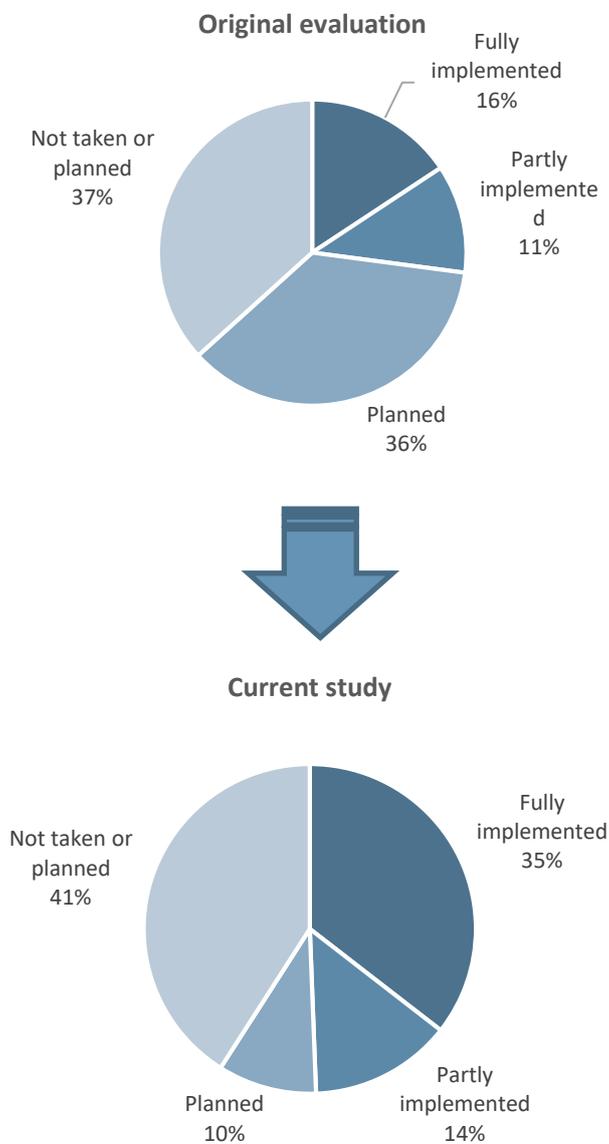
4. The study was a largely qualitative examination of what happens to different measures in a range of circumstances, in order to support Zero Waste Scotland understanding of why measures are progressed, inform projected implementation factors, and future evaluation practice. The study does not comprise a statistically robust and comprehensive examination of the beneficiary support base and progress on action.
5. In line with the objectives, sampling was deliberately focused primarily upon those who had been planning at least one measure at the time of the original evaluation. As this represented only a subset of the wider beneficiary population the findings should not be assumed to be fully representative. This in turn means the results have not been weighted.
6. The predominance of energy-related measures (in both the support delivered and the sample explored in this study) means the findings may be of limited value when trying to draw definitive conclusions regarding longer term implementation of non-energy measures.

3 Long term implementation of resource efficiency measures

3.1 Overall progression

The two charts below summarise the implementation status of the sampled measures *now*, compared to the time of the original evaluation. Overall, the original status of the sampled measures was slightly different to that of all wider recommendations given to all beneficiaries of RES support. The key reason for this is the emphasis of the study upon planned measures, itself in order to maximise reliability in answering the realisation question. So whilst the 37% 'not taken or planned' group of measures sits between the 2013-14 (30%) and 2014-15 (46%) figures⁵, the 36% of planned measures is slightly larger than the total proportions for 2013-4 (31%) and 2014-15 (23%) and commensurately the implemented proportion is slightly lower.

Figure 1: Comparison of all measure implementation status between the original evaluation and the current study [n=166 measures]



⁵ These two %s between years are themselves quite different due to the longer timeframe from support to evaluation in 2013-14.

The two charts show that there has – unsurprisingly – been a polarisation of the measures over time, though largely towards implementation. The original evaluations found only 16% of measures had been fully implemented and almost half were partially implemented or planned; the figures now show that whilst there hasn't been a substantial change in the overall proportions of measures being progressed vs. not progressed, the proportion that are fully implemented has more than doubled.

Regarding the 50 beneficiaries in the sample, in the original evaluations, the proportion that had fully or partially implemented at least one measure was 20 out of 50 (40%); updates from this study show that this figure is now 30 (60%).

The table below provides a more detailed breakdown of how – if at all - implementation status has changed between the original evaluation and current study for all 166 measures:

| | | Status at the time of the current study | | | |
|--|-----------------------------|---|--------------------|---------|-----------------------------------|
| | | Fully implemented | Partly implemented | Planned | Not taken or planned ⁶ |
| Status at the point of the original evaluation | Fully implemented [n=25] | 25 | | | |
| | Partly implemented [n=18] | 6 | 11 ⁷ | | 1 |
| | Planned [n=61] | 21 | 4 | 11 | 25 |
| | Not planned or taken [n=62] | 8 | 6 | 5 | 43 |

Table 3: How implementation status has changed over time [n=166 measures]

The table provides a more detailed insight into the churn between the different implementation status⁷; the individual changes are explored in more detail in sections 3.2 and 3.3, but key observations on the above are as follows:

- Where measures are fully implemented or partially implemented, in the vast majority of cases they stay so, especially where the change is a physical installation.
- Having no *current* plans to implement does not rule out future implementation.

Regarding the first objective of the study, the table shows the following:

- **That there continues to be progression of measures, sometimes a significant amount of time after the support, therefore following up with beneficiaries / making assumptions that there will be further progression after initial evaluation seems sensible.**

⁶ There is a slight distinction here between cases where the organisation has effectively said they cannot / will not take the action as it is unfeasible in some way (technical / financial) and cases where the organisation has said it is not being planned / is not practical at the moment, but leave open the possibility that it may be re-visited. Only in one case has a measure previously implemented now discontinued, though additional to this are any from the three organisations who have now ceased trading. All the above cases are explored in the sections below.

⁷ Two of the 11 are still not fully implemented but have been progressed somewhat since the original evaluation.

- **Almost half of partially implemented measures (8 out of 18) have been either fully implemented or are still partially implemented but to a greater degree.**
- **For the 50 of 61 planned measures where an outcome has now been reached, 25 have been fully or partly implemented, indicating a substantial overall increase in realisation rate (assuming that the measures are of at least average impact, which they are). This also supports Zero Waste Scotland assumptions of a 50% realisation for planned measures.**
- **Where previously there were no plans to implement a measure, in 19 out of 62 cases this measure is now either fully/partially implemented (14 across 9 beneficiaries) or is planned to be so (5 across 3 beneficiaries), indicating that some implementation should be assumed even for measures with an initial lack of planned implementation, as changes of circumstance can alter propensity [see sections below].**
- **There is a small organisational discontinuation rate that Zero Waste Scotland should factor into each annual projection of impact.**

Although based upon a small sample (5 beneficiaries covering 9 measures), it seemed that implementation was more likely to have happened more quickly amongst those with larger (20%+) profit margins. 6 of the 9 recommendations had already been implemented by the time of the original evaluation, a much higher rate than amongst the rest of the sample.

Sections 3.2 and 3.3 explore changes in implementation status in greater detail in order to more fully explain why these changes occurred and attempt to answer the fourth study objective: identifying differences based upon beneficiary circumstances and any broader factors.

3.2 Realisation of measures

3.2.1 Progression of partly implemented measures

Overall there were six partially implemented measures that are now fully implemented, and two that remain partially implemented but which have seen progression from the original evaluation. For the majority of cases (5 of 8) the change was related to the measure type and time elapsed.

This was largely due to a desire not to remove old bulbs until they had stopped working, which can take a number of months or even years where some lights are not used very much.

A small hotel has progressed their lighting measure ad hoc over the past three years: *“Almost all lights are LED now - we are replacing any light that goes with LEDs. We had done about 40% in the first year and we have only 10% left to do now.”* The hotel in question closed for Winter in 2016-17 which is likely to have curtailed lighting use and lengthened the period of full implementation.

Regarding the other three measures:

- One (water pipe insulation) was completed alongside a refurbishment; refurbishments can often provide a trigger for measures to be taken that seemed previously disruptive / impractical.
- One measure was perhaps slightly more complex and disruptive (installing smart heating controls and linking these up to a controlling computer at head office) took more time to complete than had elapsed by the time of the initial evaluation but only a few months longer.
- One has recently provided segregated bins for staff recycling and waste within their offices, as part of an ongoing recommendation around ensuring ‘green office practice’, therefore the recommendation itself is open-ended, does not specify activity, and was always likely to be an ad hoc process.

3.2.2 Exploring previously planned measures now taken or partly taken

Around a third (21 of 60) of the previously planned measures have now been fully implemented. A further 4 have been partially implemented. Almost all of these cases occurred 0-2 years ago and only in three cases had the action been taken almost immediately after the original evaluation. The implementation of measures fluctuates slightly rather than being a smooth line, though we anticipate that the overall trajectory of implementation of recommended measures is broadly an arc which eventually plateaus.

The cases where implementation of planned measures has occurred comprised:

- Cases where the measure was relatively complex / disruptive and so took time to research / consider before making a final decision – *“we gave really careful consideration to the different types of measures RES gave us as options because obviously it was a sizeable investment for us.”* One organisation wished to conduct a trial prior to fully implementing / rolling out the measure: *“[we] found that it worked well so we scaled it up to our entire fleet.”* These measures included new compressors, CHP plants, solar PV panels, and biomass boilers.
- Cases – again predominantly large and relatively complex – where the organisation needed to organise / source finance / source installers etc.
- Cases – which could be complex/large or less so, or a mixture of both - where the organisation were waiting for a trigger point such as premises refurbishment or an old system requiring replacement. Regarding the latter, in one case the trigger was a fire at the premises which meant a substantial

One small manufacturer implemented six recommendations in a small window of time around a refurbishment. With a small profit margin, they need to ensure the finance was saved and in place in order to carry out a full factory fit out. Implementation of the measures also involved initial research into them, sourcing 4-5 quotes on PV and also advice and plans from an Architect.

rebuild was necessary anyway: *“It was too high a cost [before the fire] but once we had to refurb the entire building and started spending then it seemed logical to do this.”*

- Where measure types required a structural change to the building, and especially where organisations are renting premises, time was often required to survey the building and potentially persuade the landlord to implement and then to see it through.

3.2.3 Exploring previously not taken measures now taken or partly taken

Of the measures that in the previous evaluation had not been planned or taken, 14 have now been implemented. Five of these were implemented more than 2 years ago and the rest within the last two years, again indicating that the implementation of measures fluctuates rather than being a smooth arc. These cases comprised the following:

- In two cases the organisation had – at the time of the original evaluation - been weighing up whether to renew their lease and therefore any recommendations were on hold as they were otherwise not worth the investment. This changed after they decided to renew.
- In one case a small village hall had not been planning to implement double glazing as they had thought it unaffordable, but were then able to access finance unexpectedly i.e. were successful in a grant bid.
- In one case an organisation with an old building had not intended to improve insulation but when they needed to repair their roof anyway the measure was re-considered. This implies that there is not so much a difference in circumstance with some of those taking and planning action, more a realisation / appreciation that there will be a trigger point.
- In one case the organisation’s owners changed subsequent to the original evaluation interview and the new owners were more supportive of the LED lighting change.

Only in one case did the eventual action differ in any way to the original recommendation; one organisation decided to only install loft insulation and not wall insulation despite the RES recommendation being insulation for the whole building. This implies that when organisations say they have no plans in place, what they often mean is that they have no clear timeframe in place, rather than not being able to envisage a set of circumstances or a trigger under which they may then progress the measure. Whilst in some of these now implemented cases the respondent did attribute in part to the RES advice, in each case a post-support trigger was necessary for implementation to occur.

Where previously unplanned action has now been taken or is planned, respondents were asked about the influence of the original advice on this. In the majority of cases the advice is believed to have made the measure ‘a little better’ (10 cases) than it would otherwise have been and in 3 cases accelerated the process. Particular ways in which the RES support influenced action are as follows:

- Ideas and information about what the organisation could be doing to be more resource efficient: *“The support gave ideas about ways to make our building more efficient.”*
- More specific guidance on the precise types of a particular measure so customers can make an informed choice on this: *“The support helped inform our selection of the type of light to replace the older fluorescent tubes with.”*
- Clarification of the cost savings / benefits arising from different actions, therefore helping to build a business case for action and so impetus to act: *“It’s added to the case we can make for funding the renovation i.e. if our building will cost less in the long term then it might be easier to fund.”*
- Endorsement of action that the customer was already considering: *“The support...put it towards the front of our minds; these are all things we were thinking of doing anyway.”*

In the two cases where the support enabled a measure that otherwise may not have happened, this was where RES loan support had also been provided subsequent to the advice. In one further case the respondent felt that they would not have been aware of the technological opportunities without the support.

3.3 Not progressing measures

3.3.1 *Partly implemented measures still not fully implemented*

In the 11 cases where previously partly implemented measures have not been further implemented to any degree, this was almost always where a measure – heating, lighting - could be rolled out to multiple buildings or sites. In the majority of cases (8), there is no expectation of taking the measure further, for most ostensibly due to cost implications but there may be a value assessment here, as implementation across some sites / buildings is not deemed necessary where the respondent does not feel there is an issue in those areas. All said further financial support would be necessary for full implementation.

For one manufacturing business there was a recommendation to install more efficient heating system. The respondent noted that this had been done sufficiently for their main office space. They noted that the recommendation was perhaps too vague on whether to also change the system in the workshops, but noted that they use the existing heaters in those rooms much less anyway.

For the remaining 3 partially implemented measures, there is an expectation that these will be completed soon; in two cases these were cases where the beneficiary is replacing existing bulbs with LEDs as they need replacing, and in one case because the organisation spent all of their funds for the previous year on refurbishment.

3.3.2 *Planned measures still being planned*

In the 11 cases where respondents are still planning measures, the reasons given for this were as follows:

- Lack of time / resource to devote; regarding hot water timers, one respondent commented that they have had higher priorities in the building and a high workload, therefore organising an electrician to implement the measure is planned for the “*next month or so*”. Again this indicates the lead time may be longer where a non-specialist within the organisation is responsible for implementation (which is the case for most beneficiaries), but also where there are other necessary measures.
- In several cases the organisation is awaiting long term planned refurb to begin before implementing the measure as this makes it more cost efficient i.e. where the existing technology would be replaced anyway; in one case because any measure would have to be taken out: “*the architect told us there is no point putting that in now as it will only need to come back out again. He said we might as well do that once the building work on the centre has been done.*” In a similar vein, one business is expecting to install a biomass boiler within six months, contingent on their new dairy being completed.
- For every other measure the principal concern is finance. One organisation was unsuccessful in being awarded money from an SME Loan Fund and so have waited until they need to replace. Another do not have the finance for all the recommendations and prioritised the heating system over the double glazing.

In the case of a small hotel there are multiple financial concerns regarding a biomass boiler, including the large up-front cost, the reliability of future RHI payments, the rising cost of fuel for it (“*I think it went from £90 to £120 per tonne quite quickly*”), and more fundamentally a direct and much larger competitor moving into their area (“*I don’t know if our business can compete with them*”).

- Two other cases relate to supplier quality issues. For a solar PV recommendation, the respondent has concerns about the credibility of suppliers they have sourced quotes from, though they also said that doubts over payback were also a consideration. In relation to zonal heating controls, one

respondent believes that quotes to their charity have been too high or failed to materialise, and attributes this to supplier fear that they will not ultimately go ahead. The respondent acknowledged that they currently don't have sufficient finance in place – and it does appear that their circumstances are not that of a typical beneficiary - but they argue that a grant award would be easy to obtain for the right quote.

In addition to those organisations citing brief follow-up phone calls, two cases across both partly implemented and planned measures, the organisation has received an updated audit from RES, though they did not link their decision to progress to this audit (they were already implementing / planning) and the purpose of the audit was unclear.

3.3.3 *Not taken measures*

The 21 cases where beneficiaries still do not plan to implement a measure, in almost all cases the measure is currently deemed unfeasible but it could be envisaged that with a change in circumstances (as seen in section 3.2.3) the measure could be re-visited and some respondents explicitly acknowledged that they are not ruling it out indefinitely.

The barrier to action is generally financial, either unaffordability or unwillingness to invest. Other barriers tend to be technical (i.e. the measure would not fit with the existing infrastructure). The type of measures in this category are commensurate with these barriers i.e. most are either resource intensive and disruptive insulation, renewables or heating system replacement / upgrade; very few are lighting. Examples include the following:

Economic

- In several cases organisations do not view the payback on biomass as being favourable and are concerned that the up-front costs are too high. One business viewed that full implementation of an EMS would require substantial time and effort across the audits and implementation of any recommended changes, which they cannot afford at present.

A small tourist attraction undertook a feasibility on biomass but concluded that the initial cost was too high and the payback period too long. The respondent said that this decision had been taken by a board of trustees and they were not sure of the acceptable payback level within the organisation.

Linked to this, one business refuses to implement any measure with a >3 year payback as the current owner is due to retire soon. Another said that their organisation had made a loss this year and therefore no measures were being contemplated. Another organisation cited the fact that the disruption (they would have to close for the duration of the installation) and resource cost were compounded by the fact that they are in rented property anyway so would not have the final decision on the measure. Another organisation specifically focused upon the reduction in FITs payments as the reason for return on investment calculations not stacking up.

- In a number of cases organisations deemed that whilst the recommended measure may be affordable, there was little value in implementing. Several said their existing technology / systems work fine already. One business pays a fixed rate for water and has recently renewed this contract for eight years; they therefore see no short or medium term benefit in the action, though may reconsider if there are changes to their rates. Refusal to change practices often related to smaller impact behavioural measures; in one case – introducing an EMS – the respondent said their doing so seemed to carry little benefit and potentially a greater resource requirement from employees.

Technical

- This usually related to the building fabric and the feasibility of implementing the measure in question. One business noted that their current listed building premises has an old roof and therefore the solar recommendation may be too heavy and may contravene regulations. The barrier regarding physical strain on the roof may be removed if and when they have to replace it, though the listed building

issue will likely remain. Another cited the unlikelihood of receiving planning permission for their renewable measure as their basis for not exploring the recommendation further. Another argued that insulation would not be feasible for their largely glass roof, whilst another reported that the roof was very difficult to access and has some insulation already.

- In two other cases the building size was felt to preclude the measure. In one case the respondent felt they genuinely could not fit the required equipment within their site. Another did not want to reduce space for parking or deliveries by further reducing these areas with the measure in question.
- For one measure the recommendation was contingent upon the respondent moving to a new owned premises (as opposed to their current rented one), which they have decided not to do.
- In several cases the organisation was given multiple recommendations whereby doing one would preclude the others i.e. they were given options on – for example – heat pumps.

In a small number of cases the respondent had forgotten that the recommendation had been made and / or did not really have a reason for it not being implemented. In these cases, the respondent usually expected to re-visit the measure.

3.3.4 *Planned measures that have regressed*

For 24 of the 61 previously planned measures, the beneficiary has ultimately taken the decision not to implement these, often for reasons that echo those highlighted in section 3.3.3. As noted above, Zero Waste Scotland assume a 50% realisation rate for planned measures. The measures were often those that were more costly and complex and so came with numerous challenges:

- One of the most common reasons given was the fact that the measure would be installed in rented premises and any technology upgrade would be the landlord's responsibility and that the landlord was not willing to make the outlay. Some respondents stated they will continue to advocate for the recommended measure.
- In several cases, upon further investigation of the measure, the organisation decided that the measure would be too costly (one example was ongoing fuel costs for biomass) or would not generate sufficient payback, especially on the basis of the internal resource needed to organise and make it happen. Several have had financial difficulties in the last few years and organisations' budgets are very tight. One respondent mentioned that the ongoing reductions in FITs payments had meant they were no longer planning to implement. One organisation reported that RES advice had substantially underestimated the likely cost of modifications that were necessary alongside the measure itself.

One beneficiary was conducting a feasibility study to look into rainwater harvesting. It was decided that the costs and disruption to tenants were too high compared to the benefits. They realised that they would need a loan to pay for the system and that despite the availability of zero interest loans to them, these have to be repaid more quickly than they could comfortably manage and the study found that payback on harvesting would be longer term. The organisation also had technical issues with having a water tank in the building, which would require structural engineering work and large beam which they wouldn't be able to fit inside the building.

- In one case the organisation was planning a refurbishment of which the recommended measure would have been a part, but are no longer doing so due to cost. There were several other cases in which the recommended measures formed part of a wider project (if not a full refurbishment) which ultimately did not go ahead, usually for cost reasons.

The only case of an *ostensibly* implemented recommendation regressing was due to respondent misunderstanding of the recommendation, which was to 'investigate' installing an ASHP. Their view was that they had investigated and so had followed the recommendation, even though ultimately they had decided not to go ahead with installation.

4 Benefits of action

4.1 The lifespan of beneficial outcomes from implemented action(s)

4.1.1 *Impacts known to date*

Regarding all responses around measure impact there is one large caveat: that some respondents either don't really monitor post-implementation or cannot disaggregate the impact of taken measures from other changes within the organisation.

RES produced projected impacts / savings for all recommended measures. All organisations that had taken measures were asked about the impacts to date from this measure and whether and how these had fluctuated.

In line with the caveat above, some respondents openly stated that they did not know; additional reasons given were either because it was too soon to tell (e.g. because the measure had been implemented recently) or due to their role (i.e. either it was not their role to check bills etc.) or no one in the organisation checks this. The latter is interesting as it indicates organisational willingness to invest in measures and yet not be sure that the intended benefits are being realised. Even where there may have been non-financial motivations for acting (e.g. comfort), payback was ostensibly a consideration for almost all organisations (except some instances where the existing equipment needed to be replaced anyway).

Where respondents felt able to respond, all agreed that the new equipment was more efficient, many were able to cite precise savings, and most thought the impact from the measure(s) had remained steady, or at least proportionate to activity on the site, as sales / footfall / production etc. can vary and many measures vary by seasonality. Exceptions to this were wherever a partly implemented measure is growing incrementally (e.g. more LEDs being installed) and in some cases where measures have been introduced to new sites and so impacts multiply.

4.1.2 *Implemented measures meeting impact expectations*

Where measures had been implemented, respondents were then asked whether these matched their expectations. Aside from cases where respondents had not checked - and one case where the respondent was sceptical of installation quality and so commensurately uncertain of predicted savings - all respondents felt impacts aligned with expectations. There were also a small number of cases where the measure provided no direct benefit to the business but respondents had seen the intended impact e.g. recycling behaviours amongst employees. One respondent also noted that as they don't use certain equipment as much as expected at the time of the RES audit, some impacts are difficult to discern, but no respondent expressed dissatisfaction with the measure or benefits.

4.1.3 *Persistence of impacts*

Finally, respondents taking or planning recommended action were asked whether they envisaged the current impacts / benefits adjusting for any reason. Again, aside from instances where partly implemented measures will be further progressed, most respondents envisaged no change to impacts. Exceptions to this were instances where respondents will build on the recommended measure e.g. adding more draught proofing.

Where they specified, all respondents intend - technological innovation and organisational performance allowing - to renew measures once the lifetime has been reached. One respondent also noted that renewal will depend upon the level of non-domestic RHI payments at the time.

As almost all respondents agreed that impacts had been steady, as expected, and would continue to be so, there is limited analysis by profile variables. Any exceptions to the general rule were due to the extent to which - or the scale at which - the organisation had chosen to implement the measure.

4.2 Realisation of employment benefits

4.2.1 Job creation

The sample provided only one example of observed job creation resulting from the implemented measures; this comprised extension of an existing role. A business moved from slowly drying out wood and selling it on – which the respondent estimated to be a 1-month-in-a-year role - to drying this and preparing it for customers much more quickly using biomass technology. This meant the organisation could increase wood production which meant more hours for the individual, and *could* lead to another role being created. Aside from this, in one case the respondent postulated that a future solar PV implementation may lead to an administration role being created (using the gained revenue).

No other new examples of job creation were cited and six respondents retracted their original evaluation predictions of job creation.

Regarding the former, this was usually because the implemented measures do not generate sufficient revenue – even collectively – to finance a new role, and because the measures themselves do not require sufficient maintenance / operation to bring such a role in-house.

Regarding the latter, this was often because the initial prediction had been fairly aspirational and indirect i.e. ‘we have taken / are going to take some action therefore the increased revenue / organisational resilience may enable us to grow / recruit’. In some cases, this anticipated benefit had – either due to initial over-optimism or due to adjusted circumstances (energy price rises, and several businesses reported that the last few years had seen reduced revenue / custom) – not materialised. There were also two cases where the organisation had not ultimately taken all the measures upon which job creation was – in theory – predicated on. However, respondents did not rule out any action they had taken having an effect upon general business performance and resilience, which may contribute to future recruitment happening sooner than it may otherwise have done.

4.2.2 Job safeguarding

Beneficiaries taking and planning action were much more likely to recognise actual and potential job *safeguarding* benefits arising from the measures taken. This increased recognition is not surprising in that even small cost savings / revenue generation may be sufficient to protect a role even when too small to create one.

Although most of those who anticipated job safeguarding benefits in the original evaluation retracted these (often for the same reasons as those stated for job creation above and also because no roles had come under threat anyway), in two cases the respondents endorsed the original statement. In one case the savings delivered by measures were felt to have protected a role, whilst the other case was less direct – the respondent felt that the measures made the venue more attractive for customers / bookings who therefore returned more than they would have. This therefore justified the need for venue receptionist and caretaker roles.

Added to these cases were two new instances⁸; in the first, the respondent felt that the monetary saving from the battery-related measure allowed them to extend a seasonal role, whilst another argues that the measure(s) taken have stabilised the business overall and in doing so have indirectly protected jobs.

Overall, there were instances of job safeguarding and even one of job creation. However, these were not common, due to both the limited scale of the benefits delivered by implemented measures and potentially because previously planned measures have not come to fruition. Where jobs benefits were

⁸ One for a measure implemented by the time of the original evaluation and one for a planned measure implemented between the original evaluation and this study.

cited, the rationale for – and scale of – the benefits was often indirect or based upon supposition, so are difficult to verify.

5 Conclusions and implications for future evaluation

The study sought to provide further clarity for Zero Waste Scotland on five key questions; each is covered below.

To what extent are partially implemented or planned measures fully realised, and to what extent have measures which beneficiaries had ‘no plans to implement’ have actually been progressed?

As noted in section 3.1, the study found a substantial progression of measures since the original evaluation:

- Almost half of partially implemented measures (8 out of 19) have been either fully implemented or are still partially implemented but to a greater degree. Where an outcome has been reached, 25 out of 50 planned measures have been fully or partly implemented, so supporting Zero Waste Scotland assumptions on the savings realised by measures reported as “planned” at the time of original evaluation. The remaining 11 planned measures are still being planned so this assumption assumes a broadly 50/50 realisation split for these. On this basis, the Zero Waste Scotland assumption that 50% planned activity will ultimately be implemented seems broadly correct.
- Where previously there were no plans to implement a measure, in 19 out of 62 cases this measure is now either fully/partially implemented (14) or is planned to be so (5), indicating that Zero Waste Scotland should factor in some turnaround of an initial lack of plans. Therefore the Zero Waste Scotland assumption that “no plans to implement” equals zero impact is an underestimate,
- Conversely, Zero Waste Scotland should also ensure that they are accounting for the low level of organisation discontinuation, which – if that organisation took action prior to ceasing to trade - means implementation is reversed. Therefore the assumption that 100% of implemented actions persist for estimated lifetimes is a slight overestimate due to evidence of some cessation of businesses, though these businesses may not act anyway.

In most cases of new action taken or planned since the original evaluation, the RES support was felt to have influenced action, especially where it had signposted and led to funding support. Other ways in which it was deemed to be influential were through providing the initial idea and through clarifying the costs and benefits of action. Despite this, in most cases the support was deemed to have made action ‘a little better’ or ‘quicker’ rather than ensuring it happened when it otherwise would not have.

To what extent are anticipated employment benefits (jobs created and safeguarded) realised, as well as the nature of these jobs, how they relate to the measure implemented and accuracy of original reporting?

The key finding was that evidence of employment-related benefits from use of beneficiary interview responses is limited and quite speculative i.e. not always directly linked to the implementation of measures.

Although there was limited recognition of the precise job creation predictions, this was more nuanced than an outright retraction of any created or safeguarded jobs figures predicted in the original evaluation. This is perhaps in part because the predictions were aspirational (measures will bolster organisational finances which may then create/safeguard jobs in the future) and / or because their achievement was contingent upon substantial action and not all recommended measures have been taken.

Jobs benefits were not well-recognised in the wider beneficiary sample either, partly as few organisations had safeguarding concerns and also due to the minimal financial benefit of the measures they had taken to date, especially when compared with variances in business performance.

Respondents were more likely to report job safeguarding benefits; none of these jobs related directly to the measure(s), but there were several instances where the respondent felt the cost saving / revenue generation from the measure(s) had enabled them to retain a position, whilst in one instance a

respondent felt improvement to the building fabric and comfort levels would mean more customer / use of the building and so safeguard roles.

The findings highlight the need for consideration of options i.e. how far it is possible / cost effective for claimed employment benefits to be scrutinised closely and the likelihood of realisation assessed, or whether to eliminate these questions and attempt a top-down assessment – or similar - instead.

The lifespan of the beneficial outcomes that businesses report in the impact evaluation.

Respondents often simply re-stated the anticipated lifetime of the technology when assessing persistence of impacts. Few have experienced or expect any significant changes in impact year to year, aside from situations where they are slowly introducing a measure (like upgrading lighting).

The current behavioural measure lifetime trajectory assumes a 5 year straight line decline to zero from impact after Year 1 to Year 5; the data does not definitively support or refute this, though the study was sometimes not in sufficient detail to explore the original and ongoing impact of any implemented behavioural recommendations e.g. training.

Were there any differences based upon beneficiary circumstances and any broader factors useful in understanding the results?

Measure type is a strong factor affecting lead time to implementation; it affects levels of up front research required, cost, perceived and actual disruption and the extent to which sourcing of specialist suppliers / installers is required.

In terms of broad measure groups, we also note that whilst waste may be part of a costs / efficiency review, it isn't subject to the same potential triggers as energy / water saving measures, which may be re-visited based upon upcoming refurbishments or organisational needs highlighted in maintenance cycles. In other words, there is more prospect of the same measure being looked at in a new light within the energy / water saving categories.

Often linked to measure type, the conditions that seem to be important – or at least can move a measure from not implemented to implemented – tended to comprise triggers: finance becoming available, a realisation that the measure (or a variant on it) would be required anyway e.g. refurbishment or previous equipment needing replacement, landlord support (if renting), and a supportive senior management team. Whilst low profit margins do not preclude action being taken, more recommendations were realised more quickly amongst those with very healthy (+20%) margins.

The issues and barriers affecting realisation of a recommended measure were often the corollary of the factors that may encourage action e.g. having rented premises, measures being large / complex (and so carrying cost, technical feasibility, disruption, and resource implications), poor business performance and low payback.

In terms of the relative importance of conditions, it seemed that even where the money was available, tenure and building regulations could prevent action.

Because few if any businesses have environmental managers or similar in-house, it was difficult to detect any effect of this in meaning measures received greater prominence or implementation being expedited by a committed individual.

The study found no clear distinction between the 2013-14 and 2014-15 customer groups in propensity to implement or extent of implementation; if anything, the latter group were more likely to have made progress. However, this is likely due to the longer lead time 2013-14 beneficiaries had before the original evaluation.

On the basis of the above, what are the potential implications of the results/insights for when and how Zero Waste Scotland evaluate future RES in-depth support?

The following list summarises the effect of the findings upon three key assumptions used by Zero Waste Scotland for forecasting lifetime impact of the support:

- The assumption that 50% planned activity will ultimately be implemented seems broadly correct; currently 41% of the measures planned at the time of the original evaluation have now been implemented and a further 18% are still being planned.
- Conversely, the assumption that “no plans to implement” equals zero impact is demonstrably an underestimate, largely because few organisations dismiss the possibility of taking the measure completely, and plans will change over time due to a range of factors and triggers.
- The assumption that 100% of implemented actions persist for estimated lifetimes is a slight overestimate due to evidence of some cessation of businesses, though these may also be the types of businesses least likely to act at all anyway.

The results indicate that there is value in evaluating the RES support – or at least following up on measure implementation - several years after the original support; a lot of measures require more time for resolution of practicalities. we did not encounter any organisational reluctance to participate and all organisations still operating had someone who could recall the support.

However, this follow up can lead to a commensurate reduction in strong attribution to the support (as other factors are necessary for implementation or because recall of the precise contribution of the support is lost). This therefore implies the value of making sure to retain a more immediate follow up, and potentially asking about hypothetical attribution – or aspects of it e.g. did the support give you the idea? - even where respondents do not have definite plans to implement. This can then be weighed against any more limited / contradictory attribution in the later follow up. There may also be value in speaking to the RES advisors to triangulate beneficiary claims that ‘they would have got there anyway’. Retaining a fairly immediate evaluation is of course necessary anyway to report likely impacts to satisfy Scottish Government / other funder requirements.

As to when any follow up should take place, after 3 years most of the recommended measures will be either completed or a decision taken not to implement, albeit this could still change given the right trigger. Zero Waste Scotland may wish to consider supplementing each annual evaluation of the previous year’s support with a small follow-up study to track action amongst previous beneficiaries⁹.

Regarding employment benefits arising from action, any initial evaluation claims / predictions of this should be probed in depth to determine the actual likelihood of these being realised.

⁹ This is something we have done for many years on our annual evaluations of Energy Saving Trust Home Renewable Advice and Grant support.

 01786 433930

 zerowastescotland.org.uk

 @ZeroWasteScot

Zero Waste Scotland is a registered company in Scotland [SC436030]. Registered office: Ground Floor, Moray House, Forthside Way, Stirling FK8 1QZ